Appendix O

Opportunities for Energy Conservation in Residential Development

The recent energy crisis affecting much of California added another expense to the high cost of housing in the San Francisco Bay Area. A typical home in Hayward contains a number of electric and gas devices and appliances ranging from air conditioners and refrigerators to alarm clocks. While appliances contribute to the amount of energy used in a residential building, other factors also contribute to energy usage including:

- Age of building
- Type of construction
- Location
- Amount and type of landscaping
- Climate
- Type and age of appliances
- Type and amount of insulation
- Heating, ventilation and cooling

The following table presents an estimate of the cost of operating home appliances.

Home Appliance Energy Costs

Appliance	**Cost to Operate**
Hair Dryer	$.01 per 5-minute use
100 Watt Incandescent Light Bulb	$.01 per hour
Color Television	$.01 to $.05 per hour
Stereo System	$.01 to $.03 per hour
Refrigerator	$10 to $22 per month
Microwave Oven	$.01 to $.03 per 10-minute use
Personal Computer	$.01 to $.02 per hour
Dishwasher	$.37 per load
Water Heater	$20 to $70 per month
Clothes Washer	$.03 to $.23 per load
Dryer	$.30 to $.60 per load
Vacuum Cleaner	$.05 to $.09 per hour
Gas Furnace	$16 to $40 per month – small home, <2,000 square feet $114 to $400 per month – large home, >4,000 square feet

Source: Pacific Gas and Electric. Costs are based on the average 1997 residential rates of about 12 cents per kilowatthour of electricity and 63 cents per therm of gas.

Since lower income households have less disposable income, they are impacted even more by increasing energy costs. An increase in utility expenses are similar to a rent increase. According to Alameda County Housing Authority staff, a typical lower-income household can barely afford basic shelter costs. Therefore, utility bills must compete with other non-shelter expenses including, food, clothing, and transportation.

The City of Hayward addresses energy use and conservation at three levels:

1. New construction
2. Rehabilitation of residential buildings
3. Resident conservation

New Construction – City building codes and recycling requirements support energy efficient construction techniques, materials and minimizing the amount of material added to the waste stream. City building codes implement the 2001 Energy Code Title 24 Energy Standard Building Codes/State Energy requirements for new construction and additions. The Energy Efficiency Standards for Residential and Nonresidential Buildings were established in 1978 in response to a state mandate to reduce California's energy demand. Since their establishment, the standards (along with standards for energy efficient appliances) have helped Californians save more than $15.8 billion in electricity and natural gas costs. It is estimated that number will save an additional $43 billion by 2011. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The 1998 Standards, on line now, have an effective date of July 1, 1999.

Rehabilitation – The City conducts several residential rehabilitation programs that include work ranging from minor repairs (installing smoke detectors and water heater restraints) to replacing roofs and whole-house remodeling. These modifications have evolved over the life of the conservation programs and are periodically updated to reflect new building code requirements, construction techniques and new energy efficiency technologies. The following are items that are often included in the scope of work for a typical rehabilitation project conducted through the City's Housing Conservation programs:

- Furnish and install a new gas fired energy efficient furnace.
- Furnish all labor and materials to install a 3" foam insulated roof system.
- Furnish and install new weather stripping on front/side door.
- Replace existing exterior light fixtures with fluorescent fixtures.
- Furnish and install new standard energy efficient gallon water heater.
- Re-glaze/Repair/Replace damaged/deteriorated windows.
- Furnish and install/Replace defecting energy efficient dishwasher.
- Replace/Install new electric/gas energy efficient range.
- Replace/Install new electric/gas energy efficient cook top.
- Replace/Install new electric/gas energy efficient built in oven.

- Replace/Install new energy efficient range hood.
- Install ceiling/wall energy efficient exhaust fan with new fan equivalent in capacity to existing and vented to the exterior.
- Furnish and install a new toilet to meet water conservation requirements of 1.6 gallons per flush.
- Furnish and install a new single/dual control shower mixer valve, arm and low flow shower head with maximum 31/2 gallons per minute discharge.
- Furnish and install R-13, batt insulation in the walls and R-30 batt insulation in the ceiling.

Housing Conservation Program staff estimate that improvements such as those listed above may result in savings to residents by reducing the demand for gas and electricity.

Resident Conservation: The City of Hayward advocates the following strategies for reducing energy costs at home:

- Cool naturally. Take advantage of breezy days and nights by opening doors and windows and turning off your cooling system. Portable or ceiling fans can help you stay cool for a fraction of the cost of air conditioning.
- Give appliances a break during hot afternoons and evenings. Many appliances create added heat and moisture, making your air conditioner work harder. Unplug electronic devices when not in use.
- Take showers instead of baths, and shorten shower time. Baths call for 4.5 times as much hot water as showers. Cutting a shower in half will reduce water-heating costs by 33%.
- Don't preheat the oven. If you have a microwave, use it instead if a conventional stove for reheating and cooking small quantities of food. This will save 50% of the cooking energy needs.
- Don't over light. While more light is typically needed in reading and work areas, lighting levels can be comfortably reduced in other areas. Switch to lower wattages whenever possible. Remember to turn off lights whenever they are not needed.
- Wash only full loads in a dishwasher on the shortest cycle. That cycle is enough clean dishes; then open the door and let the dishes dry naturally.
- Operate all computer components on a single power strip, and switch off when not in use.
- Replace items such as refrigerator, clothes washer, and dishwasher with an ENERGY STAR-labeled model to save energy.
- Set the thermostat to 78 degrees F or more during the summer to save 10-20% of cooling costs.
- Consider a solar water heating system for swimming pools. Switch pool filter and sweeper operations to off-peak hours, and consider replacing pool pumps and motors with updated, more efficient equipment.